```
AU   WATTIG B (Reprint); SCHALOW G; MADAUSS M; HEYDENREICH F; WARZOK R;
     CERVOSNAVARRO J
CS   UNIV GREIFSWALD, INST PATHOL, O-2200 GREIFSWALD, GERMANY (Reprint); FREE
     UNIV BERLIN, INST NEUROPATHOL, W-1000 BERLIN 33, GERMANY
CYA  GERMANY
SO   ACTA HISTOCHEMICA, (1992) Supp. [42], pp. 333-339.
     ISSN: 0065-1281.
PB   GUSTAV FISCHER VERLAG, VILLENGANG 2, D-07745 JENA, GERMANY.
DT   Article; Journal
FS   LIFE
LA   English
REC  Reference Count: 20
ED   Entered STN: 1994
     Last Updated on STN: 1994
     *ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS*


=> d his

     (FILE 'HOME' ENTERED AT 17:50:04 ON 06 SEP 2006)

     FILE 'REGISTRY' ENTERED AT 17:50:12 ON 06 SEP 2006
L1             1 S ADENOSINE/CN
L2             1 S INOSINE/CN
L3             1 S GUANINE/CN
L4             1 S PURINE/CN
                 SEL L1
                 SEL L2
                 SEL L3
                 SEL L4

     INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, ANTE, AQUALINE,
     AQUASCI, BIOENG, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CAPLUS,
     CEABA-VTB, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE, DISSABS, DRUGB,
     DRUGMONOG2, DRUGU, EMBAL, EMBASE, ...' ENTERED AT 17:50:59 ON 06 SEP 2006
                 SEA (E1-E76) AND REGENERATION
                ---------
               65   FILE ADISCTI
              143   FILE ADISINSIGHT
               83   FILE ADISNEWS
             5099   FILE AGRICOLA
              542   FILE ANABSTR
              882   FILE ANTE
             2281   FILE AQUALINE

     FILE 'CAPLUS' ENTERED AT 17:52:15 ON 06 SEP 2006
L5          1298 S L1/THU OR L2/THU OR L3/THU
L6             0 S L5 AND (SPINAL(W)CORD) AND REGENRATION
L7             6 S L5 AND (SPINAL(W)CORD) AND REGENERATION
L8             1 S L7 NOT PY>2002

     FILE 'MEDLINE, BIOSIS, EMBASE, SCISEARCH' ENTERED AT 17:55:27 ON 06 SEP
     2006
L9        184137 S (E1-E76) AND REGENERATION
L10         9044 S L9 AND (SPINAL(W)CORD)
L11         5954 S L10 NOT PY>2002
L12         3215 DUP REM L11 (2739 DUPLICATES REMOVED)
L13         3195 S (ADENOSINE OR INOSINE OR GUANOSINE OR PURINE) AND REGENERATIO
L14         2202 DUP REM L13 (993 DUPLICATES REMOVED)
L15         1768 S L14 NOT PY>2002
L16         1768 S L15 AND REGENERATION
L17           28 S L15 AND AXON

=> logoff
ALL L# QUERIES AND ANSWER SETS ARE DELETED AT LOGOFF
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 NEWS EXPRESS  JUNE 30 CURRENT WINDOWS VERSION IS V8.01b, CURRENT
               MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP),
               AND CURRENT DISCOVER FILE IS DATED 26 JUNE 2006.

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COST IN U.S. DOLLARS                                    SINCE FILE      TOTAL
                                                           ENTRY    SESSION
FULL ESTIMATED COST                                         0.21       0.21

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=> s adenosine/cn
L1            1 ADENOSINE/CN

=> s inosine/cn
L2            1 INOSINE/CN

=> s guanine/cn
L3            1 GUANINE/CN

=> s purine/cn
L4            1 PURINE/CN
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=> sel l1
E1 THROUGH E24 ASSIGNED

=> sel l2
E25 THROUGH E51 ASSIGNED

=> sel l3
E52 THROUGH E76 ASSIGNED

=> sel l4
E77 THROUGH E89 ASSIGNED

=> index bioscience patents
FILE 'DRUGMONOG' ACCESS NOT AUTHORIZED
FILE 'ENCOMPPAT2' ACCESS NOT AUTHORIZED
COST IN U.S. DOLLARS                                    SINCE FILE      TOTAL
                                                           ENTRY    SESSION
FULL ESTIMATED COST                                        20.80      21.01

INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, ANTE, AQUALINE,
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       CEABA-VTB, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE, DISSABS, DRUGB,
       DRUGMONOG2, DRUGU, EMBAL, EMBASE, ...' ENTERED AT 17:50:59 ON 06 SEP 2006

92 FILES IN THE FILE LIST IN STNINDEX

Enter SET DETAIL ON to see search term postings or to view
search error messages that display as 0* with SET DETAIL OFF.

=> s (E1-E76) and regeneration
         65   FILE ADISCTI
        143   FILE ADISINSIGHT
   2 FILES SEARCHED...
         83   FILE ADISNEWS
       5099   FILE AGRICOLA
        542   FILE ANABSTR
        882   FILE ANTE
   6 FILES SEARCHED...
<------User Break------>

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FULL ESTIMATED COST                                         1.22      22.23

FILE 'CAPLUS' ENTERED AT 17:52:15 ON 06 SEP 2006
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FILE COVERS 1907 - 6 Sep 2006  VOL 145 ISS 11
FILE LAST UPDATED: 5 Sep 2006  (20060905/ED)

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=> s l1/thu or l2/thu or l3/thu
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STN" for information on contacting the nearest STN Help Desk by
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=> s l1/thu or l2/thu or l3/thu
         21011 L1
        807993 THU/RL
          1021 L1/THU
                 (L1 (L) THU/RL)
          6093 L2
        807993 THU/RL
           251 L2/THU
                 (L2 (L) THU/RL)
         10370 L3
        807993 THU/RL
           123 L3/THU
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L5         1298 L1/THU OR L2/THU OR L3/THU

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         67927 CORD
         40534 SPINAL(W)CORD
            10 REGENRATION
L6           0 L5 AND (SPINAL(W)CORD) AND REGENRATION

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         67927 CORD
         40534 SPINAL(W)CORD
        107301 REGENERATION
L7           6 L5 AND (SPINAL(W)CORD) AND REGENERATION

=> s l7 1-6 ti
MISSING OPERATOR L7 1-6
The search profile that was entered contains terms or
nested terms that are not separated by a logical operator.

=> d l7 1-6 ti

L7   ANSWER 1 OF 6  CAPLUS  COPYRIGHT 2006 ACS on STN
TI   Composition and method for treating occlusive vascular diseases, nerve
     regeneration, and wound healing

L7   ANSWER 2 OF 6  CAPLUS  COPYRIGHT 2006 ACS on STN
TI   Methods of stimulating axonal growth of CNS neurons using Nogo receptor
     antagonists in combination with growth factors

L7   ANSWER 3 OF 6  CAPLUS  COPYRIGHT 2006 ACS on STN
TI   Methods and compositions use transcription factor NF-AT agonists for
     enhancing neuron growth and survival

L7   ANSWER 4 OF 6  CAPLUS  COPYRIGHT 2006 ACS on STN
TI   Inosine reverses the inhibitory effects of the L-type Ca2+ channel
     antagonist, DM-BODIPY-dihydropyridine, on neuritogenesis in an in vitro
     rat superior cervical ganglia axotomy model

L7   ANSWER 5 OF 6  CAPLUS  COPYRIGHT 2006 ACS on STN
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TI   Methods and compositions for producing a neurosalutary effect in a subject

L7   ANSWER 6 OF 6  CAPLUS  COPYRIGHT 2006 ACS on STN
TI   Inosine stimulates extensive axon collateral growth in the rat
     corticospinal tract after injury


=> s l7 not py>2002
       4292839 PY>2002
L8           1 L7 NOT PY>2002

=> d l8 1 ti

L8   ANSWER 1 OF 1  CAPLUS  COPYRIGHT 2006 ACS on STN
TI   Inosine stimulates extensive axon collateral growth in the rat
     corticospinal tract after injury


=> file medline biosis embase scisearch
COST IN U.S. DOLLARS                                  SINCE FILE      TOTAL
                                                         ENTRY    SESSION
FULL ESTIMATED COST                                      24.11      46.34

FILE 'MEDLINE' ENTERED AT 17:55:27 ON 06 SEP 2006

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FILE 'SCISEARCH' ENTERED AT 17:55:27 ON 06 SEP 2006
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=> s (E1-E76) and regeneration
   2 FILES SEARCHED...
L9       184137 ((B-ADENOSINE/BI OR B-D-ADENOSINE/BI OR "B-D-RIBO
                FURANOSE, 1-(6-AMINO-9H-PURIN-9-YL)-1-DEOXY-"/BI OR "B-D-RI
               BOFURANOSIDE, ADENINE-9"/BI OR A/BI OR "ADENINE RIBOSIDE"/BI OR
               ADENOCARD/BI OR ADENOCOR/BI OR ADENOSCAN/BI OR ADENOSINE/BI OR
               ADREKAR/BI OR BONITON/BI OR D-ADENOSINE/BI OR MYOCOL/BI OR "NSC
               7652"/BI OR NUCLEOCARDYL/BI OR RIBOADENOSINE/BI OR SANDESIN/BI
               OR 46946-45-6/BI OR 46969-16-8/BI OR 58-61-7/BI OR 9-B-D-RIB
               OFURANOSYL-9H-PURIN-6-AMINE/BI OR 9-B-D-RIBOFURANOSYLADENINE
               /BI OR "9H-PURIN-6-AMINE, 9-B-D-RIBOFURANOSYL-"/BI OR ATOREL
               /BI OR HXR/BI OR "HYPOXANTHINE RIBONUCLEOSIDE"/BI OR "HYPOXANTHIN
               E RIBOSIDE"/BI OR "HYPOXANTHINE 9-B-D-RIBOFURANOSIDE"/BI OR
               "HYPOXANTHINE, 9-B-D-RIBOFURANOSYL-"/BI OR HYPOXANTHOSINE/BI
                OR INO/BI OR INOSIE/BI OR INOSINE/BI OR "NSC 20262"/BI OR OXIAMI
               N/BI OR PANHOLIC-L/BI OR RIBONOSINE/BI OR SELFER/BI OR TROPHICARD
               YL/BI OR "1,9-DIHYDRO-9-B-D-RIBOFURANOSYL-6H-PURIN-6-ONE"/BI
                OR 12712-98-0/BI OR 1

=> s l9 and (spinal(w)cord)
L10       9044 L9 AND (SPINAL(W) CORD)

=> s l10 not py>2002
L11       5954 L10 NOT PY>2002

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PROCESSING IS APPROXIMATELY  72% COMPLETE FOR L11
PROCESSING COMPLETED FOR L11
L12       3215 DUP REM L11 (2739 DUPLICATES REMOVED)
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=> d l12 1-10 ti

L12  ANSWER 1 OF 3215      MEDLINE on STN
TI   Development. A tail of transdifferentiation.

L12  ANSWER 2 OF 3215      MEDLINE on STN
TI   Medicine: clearing a path for nerve growth.

L12  ANSWER 3 OF 3215      MEDLINE on STN
TI   A super feeling. Are there signs of hope in Christopher Reeve's
     modest recovery?.

L12  ANSWER 4 OF 3215      MEDLINE on STN
TI   [A dream can become reality. How to walk after paraplegia?].
     Ein Traum konnte Wirklichkeit werden. Wieder laufen nach Querschnitt?.

L12  ANSWER 5 OF 3215      MEDLINE on STN
TI   Obtaining olfactory ensheathing cells from extra-cranial sources a
     step closer to clinical transplant-mediated repair of the CNS?.

L12  ANSWER 6 OF 3215  BIOSIS  COPYRIGHT (c) 2006 The Thomson Corporation  on
     STN
TI   Chondroitinase ABC promotes functional recovery after spinal
     cord injury.

L12  ANSWER 7 OF 3215  EMBASE  COPYRIGHT (c) 2006 Elsevier B.V. All rights
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TI   Functional reorganization and stability of somatosensory-motor cortical
     topography in a tetraplegic subject with late recovery.

L12  ANSWER 8 OF 3215  SCISEARCH  COPYRIGHT (c) 2006 The Thomson Corporation
     on STN
TI   Magnetic resonance microimaging of intraaxonal water diffusion in live
     excised lamprey spinal cord

L12  ANSWER 9 OF 3215      MEDLINE on STN
TI   Neuroprotective autoimmunity: naturally occurring CD4+CD25+ regulatory T
     cells suppress the ability to withstand injury to the central nervous
     system.

L12  ANSWER 10 OF 3215      MEDLINE on STN                DUPLICATE 1
TI   Absence of fibroblast growth factor 2 promotes oligodendroglial
     repopulation of demyelinated white matter.


=> s (adenosine or inosine or guanosine or purine) and regeneration
L13       3195 (ADENOSINE OR INOSINE OR GUANOSINE OR PURINE) AND REGENERATION

=> dup rem l13
PROCESSING IS APPROXIMATELY  24% COMPLETE FOR L13
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L14        2202 DUP REM L13 (993 DUPLICATES REMOVED)

=> s l14 not py>2002
L15       1768 L14 NOT PY>2002

=> s l15 and regeneration
L16       1768 L15 AND REGENERATION

=> s l15 and axon
L17         28 L15 AND AXON

=> d l17 1-28 ti
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L17 ANSWER 1 OF 28 MEDLINE on STN
TI Characterization of new cell permeable C3-like proteins that inactivate Rho and stimulate neurite outgrowth on inhibitory substrates.

L17 ANSWER 2 OF 28 MEDLINE on STN
TI Changes in P2Y and P2X purinoceptors in reactive glia following axonal degeneration in the rat optic nerve.

L17 ANSWER 3 OF 28 MEDLINE on STN
TI A reliable method to reduce collagen scar formation in the lesioned rat spinal cord.

L17 ANSWER 4 OF 28 MEDLINE on STN
TI Regenerating motor neurons express Nna1, a novel ATP/GTP-binding protein related to zinc carboxypeptidases.

L17 ANSWER 5 OF 28 MEDLINE on STN
TI A purine-sensitive pathway regulates multiple genes involved in axon regeneration in goldfish retinal ganglion cells.

L17 ANSWER 6 OF 28 MEDLINE on STN
TI Axon outgrowth is regulated by an intracellular purine -sensitive mechanism in retinal ganglion cells.

L17 ANSWER 7 OF 28 MEDLINE on STN
TI Neurohumoral control of blood vessels: some future directions.

L17 ANSWER 8 OF 28 MEDLINE on STN
TI Axonal transport and transcellular transfer of nucleosides and polyamines in intact and regenerating optic nerves of goldfish: speculation on the axonal regulation of periaxonal cell metabolism.

L17 ANSWER 9 OF 28 BIOSIS COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI INTRAOCULAR ELEVATION OF CYCLIC AMP POTENTIATES CNTF - INDUCED REGENERATION OF RETINAL GANGLION CELL AXONS IN ADULT RATS.

L17 ANSWER 10 OF 28 BIOSIS COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI Stimulation of CNS regeneration through a purine -sensitive mechanism.

L17 ANSWER 11 OF 28 BIOSIS COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI Rapid arrest of axon elongation by brefeldin A: A role for the small GTP-binding protein ARF in neuronal growth cones.

L17 ANSWER 12 OF 28 BIOSIS COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI Neurons regulate Schwann cell genes by diffusible molecules.

L17 ANSWER 13 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights reserved on STN
TI Inosine stimulates axon growth in vitro and in the adult CNS.

L17 ANSWER 14 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights reserved on STN
TI Inactivation of intracellular Rho to stimulate axon growth and regeneration.

L17 ANSWER 15 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights reserved on STN
TI Nogo on the Go.

L17 ANSWER 16 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights

reserved on STN
TI Signaling the pathway to regeneration.

L17 ANSWER 17 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights reserved on STN
TI Inosine regulates axon regeneration in retinal ganglion cells.

L17 ANSWER 18 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights reserved on STN
TI Inactivation of rho signaling pathway promotes CNS axon regeneration.

L17 ANSWER 19 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights reserved on STN
TI Expression of the mitotic motor protein Eg5 in postmitotic neurons: Implications for neuronal development.

L17 ANSWER 20 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights reserved on STN
TI Axonal contact regulates expression of α2 and β2 isoforms of Na+,K+- ATPase in Schwann cells: Adhesion molecules and nerve regeneration.

L17 ANSWER 21 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights reserved on STN
TI Subcellular distribution of axonally transported adenylate cyclase: Effect of nerve constriction and comparison with acetylcholinesterase.

L17 ANSWER 22 OF 28 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI Where the rubber meets the road: netrin expression and function in developing and adult nervous systems

L17 ANSWER 23 OF 28 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI Age-related changes underlie switch in netrin-1 responsiveness as growth cones advance along visual pathway

L17 ANSWER 24 OF 28 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI A purine-sensitive mechanism regulates the molecular program for axon growth

L17 ANSWER 25 OF 28 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI Motor nerve transplantation

L17 ANSWER 26 OF 28 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI ENHANCEMENT OF NERVE-FIBER REGENERATION BY NUCLEOTIDES AFTER PERIPHERAL-NERVE CRUSH DAMAGE - ELECTROPHYSIOLOGIC AND MORPHOMETRIC INVESTIGATIONS

L17 ANSWER 27 OF 28 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI ACCELERATION OF NERVE AND MUSCLE REGENERATION BY ADMINISTRATION OF NUCLEOTIDES - ELECTRONEUROPHYSIOLOGICAL AND MORPHOMETRICAL INVESTIGATIONS

L17 ANSWER 28 OF 28 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI CELLULAR PATHOLOGY OF THE NERVE MICROENVIRONMENT IN GALACTOSE INTOXICATION

=> d l17 6 9 10 13 14 16 17 24 26 27 ti abs bib

L17 ANSWER 6 OF 28 MEDLINE on STN
TI Axon outgrowth is regulated by an intracellular purine -sensitive mechanism in retinal ganglion cells.
AB Although purinergic compounds are widely involved in the intra- and intercellular communication of the nervous system, little is known of their involvement in the growth and regeneration of neuronal connections. In dissociated cultures, the addition of adenosine or guanosine in the low micromolar range induced goldfish retinal ganglion cells to extend lengthy neurites and express the growth-associated protein GAP-43. These effects were highly specific and did not reflect conversion of the nucleosides to their nucleotide derivatives; pyrimidines, purine nucleotides, and membrane-permeable, nonhydrolyzable cyclic nucleotide analogs were all inactive. The activity of adenosine required its conversion to inosine, because inhibitors of adenosine deaminase rendered adenosine inactive. Exogenously applied inosine and guanosine act directly upon an intracellular target, which may coincide with a kinase described in PC12 cells. In support of this, the effects of the purine nucleosides were blocked with purine transport inhibitors and were inhibited competitively with the purine analog 6-thioguanine (6-TG). In PC12 cells, others have shown that 6-TG blocks nerve growth factor-induced neurite outgrowth and selectively inhibits the activity of protein kinase N, a partially characterized, nerve growth factor-inducible serine-threonine kinase. In both goldfish and rat retinal ganglion cells, 6-TG completely blocked outgrowth induced by other growth factors, and this inhibition was reversed with inosine. These results suggest that axon outgrowth in central nervous system neurons critically involves an intracellular purine-sensitive mechanism.
AN 1999009073 MEDLINE
DN PubMed ID: 9792672
TI Axon outgrowth is regulated by an intracellular purine -sensitive mechanism in retinal ganglion cells.
AU Benowitz L I; Jing Y; Tabibiazar R; Jo S A; Petrausch B; Stuermer C A; Rosenberg P A; Irwin N
CS Laboratories for Neuroscience Research in Neurosurgery, Children's Hospital, Harvard Medical School, Boston, Massachusetts 02115, USA.. benowitz@a1.tch.harvard.edu
NC R01 EY 05690 (NEI)
SO The Journal of biological chemistry, (1998 Nov 6) Vol. 273, No. 45, pp. 29626-34.
Journal code: 2985121R. ISSN: 0021-9258.
CY United States
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 199812
ED Entered STN: 15 Jan 1999
Last Updated on STN: 15 Jan 1999
Entered Medline: 10 Dec 1998

L17 ANSWER 9 OF 28 BIOSIS COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI INTRAOCULAR ELEVATION OF CYCLIC AMP POTENTIATES CNTF - INDUCED REGENERATION OF RETINAL GANGLION CELL AXONS IN ADULT RATS.
AB In tissue culture, elevation of cyclic AMP (cAMP) alters neuronal responses to diffusible growth factors and blocks the effects of myelin-associated inhibitory factors, properties that may enhance in vivo neural repair processes. Here we use an established, quantifiable model of CNS injury in adult rats to examine directly the effect of elevated cAMP on axon regeneration in vivo. We studied the separate and combined effects of intravitreal injections of neurotrophic factors and a cAMP analog 8-(4-chlorophenylthio)-adenosine 3':5"-cyclic monophosphate (CPT-cAMP) on the regeneration of

axotomized adult retinal ganglion cell (RGC) axons into peripheral nerve (PN) autografts in Sprague-Dawley rats. Surgery was performed under halothane anesthesia. After 3 weeks, regenerating RGCs were retrogradely labelled with fluorogold. Compared to non-injected or saline injected rats, elevation of cAMP alone did not increase RGC viability or the number of RGCs regrowing axons into PN grafts. Ciliary neurotrophic factor (CNTF) injections increased RGC viability and regenerative growth. The latter effect was significantly enhanced by co-application of CPT-cAMP; under these conditions over 60% of surviving RGCs regenerated their axons. Intraocular neurotrophin (NT) 4/5 injections also promoted RGC survival, but regeneration into PN grafts was reduced, most likely as a result of increased intra-retinal sprouting. This effect was partially offset by combined CPT-cAMP and NT-4/5 injections. These in vivo findings demonstrate that cAMP can act in concert with neurotrophic factors to promote axon regeneration in adult mammalian CNS.

AN 2003:293965 BIOSIS

DN PREV200300293965

TI INTRAOCULAR ELEVATION OF CYCLIC AMP POTENTIATES CNTF - INDUCED REGENERATION OF RETINAL GANGLION CELL AXONS IN ADULT RATS.

AU Harvey, A. R. [Reprint Author]; Cui, Q. [Reprint Author]

CS School of Anatomy and Human Biol, The Univ Of Western Australia, Perth, WA, Australia

SO Society for Neuroscience Abstract Viewer and Itinerary Planner, (2002) Vol. 2002, pp. Abstract No. 334.2. http://sfn.scholarone.com. cd-rom. Meeting Info.: 32nd Annual Meeting of the Society for Neuroscience. Orlando, Florida, USA. November 02-07, 2002. Society for Neuroscience.

DT Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
Conference; (Meeting Poster)

LA English

ED Entered STN: 25 Jun 2003
Last Updated on STN: 25 Jun 2003

L17 ANSWER 10 OF 28 BIOSIS

TI Stimulation of CNS regeneration through a purine -sensitive mechanism.

AB The corticospinal tract (CST) is essential for voluntary control of the body's distal musculature. Thus, its failure to regenerate after injury is of considerable clinical significance. Here, we examined whether the purine nucleoside inosine induces CST axons to grow after injury in mature rats. We previously showed that inosine stimulates certain neurons to express GAP-43, alpha-1 tubulin, L1, and other genes important for axon outgrowth, apparently by activating a protein kinase that is part of an intracellular signal transduction pathway. In the rat, the CST arises in layer 5 pyramidal cells of the sensorimotor cortex (SMC), decussates in the caudal medulla, and projects via the contralateral dorsal funiculus primarily to interneurons of the cervical and lumbar enlargements. To examine collateral sprouting, we transected the CST unilaterally via a ventral surgical approach in the rostral medulla and treated the non-axotomized SMC with inosine for 2 weeks using a minipump. Axon trajectories were visualized using biotinylated dextran amine. Inosine induced uninjured CST fibers to sprout collaterals that crossed over to the denervated side of the cervical spinal cord, coursed through the white matter, and in some instances, formed synapses in the appropriate lamina (IV) in the denervated gray matter. In preliminary studies, we find that inosine applied to the axotomized SMC enables transected CST axons to regenerate around the lesion site. However, the scar and lesion cavity represent formidable barriers to growth, and we are investigating whether cellular implants in this region form a suitable substrate that growth-enabled CST axons can traverse. Thus, inosine, in combination with other therapies, may be clinically beneficial in the treatment of CNS injuries.

AN 2001:252245 BIOSIS

DN PREV200100252245
TI Stimulation of CNS regeneration through a purine -sensitive mechanism.
AU Benowitz, Larry I. [Reprint author]
CS Neurosurgery/Neuroscience, Children's Hospital, Harvard Medical School, 300 Longwood Avenue, Boston, MA, 02115, USA
SO FASEB Journal, (March 8, 2001) Vol. 15, No. 5, pp. A741. print.
Meeting Info.: Annual Meeting of the Federation of American Societies for Experimental Biology on Experimental Biology 2001. Orlando, Florida, USA. March 31-April 04, 2001.
CODEN: FAJOEC. ISSN: 0892-6638.
DT Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
LA English
ED Entered STN: 23 May 2001
Last Updated on STN: 19 Feb 2002

L17 ANSWER 13 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights reserved on STN
TI Inosine stimulates axon growth in vitro and in the adult CNS.
AB Unlike mammals, lower vertebrates can regenerate their optic nerves and certain other CNS pathways throughout life. To identify the molecular bases of this phenomenon, we developed a cell culture model and found that goldfish retinal ganglion cells will regenerate their axons in response to the purine nucleoside inosine. Inosine acts through a direct intracellular mechanism and induces many of the changes in gene expression that underlie regenerative growth in vivo, e.g., upregulation of GAP-43, Tα-1 tubulin, and the cell-adhesion molecule, L1. N-kinase, a 47-49-kDa serine-threonine kinase, may mediate the effects of inosine and serve as part of the modular signal transduction pathway that controls axon growth. In vivo, inosine stimulates extensive axon growth in the mature rat corticospinal tract. Following unilateral transection of the corticospinal tract, inosine applied to the intact sensorimotor cortex stimulated layer 5 pyramidal cells to upregulate GAP-43 expression and to sprout axon collaterals. These collaterals crossed the midline at the level of the cervical enlargement and reinnervated regions whose normal connections had been severed. Further understanding of the molecular changes that lie upstream and downstream of N-kinase may lead to new insights into the control of axon growth and to novel methods to improve functional outcome in patients with CNS injury.
AN 2002454703 EMBASE
TI Inosine stimulates axon growth in vitro and in the adult CNS.
AU Benowitz L.I.; Goldberg D.E.; Irwin N.
CS L.I. Benowitz, Children's Hospital, Harvard Medical School, Department of Surgery, 300 Longwood Avenue, Boston, MA 02115, United States. larry.benowitz@tch.harvard.edu
SO Progress in Brain Research, (2002) Vol. 137, pp. 389-399. .
Refs: 42
ISSN: 0079-6123 CODEN: PBRRA4
CY Netherlands
DT Journal; Conference Article
FS 008 Neurology and Neurosurgery
021 Developmental Biology and Teratology
030 Pharmacology
037 Drug Literature Index
LA English
SL English
ED Entered STN: 9 Jan 2003
Last Updated on STN: 9 Jan 2003

L17 ANSWER 14 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights reserved on STN

TI Inactivation of intracellular Rho to stimulate axon growth and regeneration.

AB Our studies indicate that the small GTPase Rho is an important intracellular target for promoting axon regrowth after injury. In tissue culture, inactivation of the Rho signaling pathway is effective in promoting neurite growth on growth inhibitory CNS substrates by two different methods: inactivation of Rho with C3 transferase, and inactivation by dominant negative mutation of Rho. In vivo, we have documented the regeneration of transfected axons after treatment with C3 in two different animals models, microcrush lesion of the adult rat optic nerve, and over-hemisection of adult mouse spinal cord. Mice treated with C3 after SCI showed impressive functional recovery, notwithstanding the fact that mice differ from rats in their response to spinal cord injury, especially in the extent of cavitation at the lesion site (Steward et al., 1999). It remains to be determined to what extent the regeneration of specific descending and ascending spinal axons contribute to the recovery, and whether inactivation of Rho enhances the spontaneous plasticity of axonal and dendritic remodeling after SCI. Inactivation of Rho with C3 to promote regeneration and functional recovery after SCI is simple, and our studies reveal the potential for a new, straightforward technique to promote axon regeneration.

AN 2002454701 EMBASE

TI Inactivation of intracellular Rho to stimulate axon growth and regeneration.

AU Ellezam B.; Dubreuil C.; Winton M.; Loy L.; Dergham P.; Selles-Navarro I.; McKerracher L.

CS L. McKerracher, Dept. de Pathologie/Biol. Cellulaire, Ctr. de Rech. en Sci. Neurologiques, Universite de Montreal, Montreal, Que. H3T 1J4, Canada. mckerral@patho.umontreal.ca

SO Progress in Brain Research, (2002) Vol. 137, pp. 371-380. .
Refs: 57
ISSN: 0079-6123 CODEN: PBRRA4

CY Netherlands

DT Journal; Conference Article

FS 008 Neurology and Neurosurgery
021 Developmental Biology and Teratology
029 Clinical Biochemistry

LA English

SL English

ED Entered STN: 9 Jan 2003
Last Updated on STN: 9 Jan 2003

L17 ANSWER 16 OF 28 EMBASE

TI Signaling the pathway to regeneration.

AB Robust axon regeneration occurs after peripheral nerve injury through coordinated activation of a genetic program and local intracellular signaling cascades. Although regeneration -associated genes are being identified with increasing frequency, most aspects of regeneration-associated intracellular signaling remain poorly understood.. Two independent studies now report that upregulation of cAMP is a component of the PNS regeneration program that can be exploited to enhance axon regeneration through the normally inhibitory CNS environment.

AN 2002266669 EMBASE

TI Signaling the pathway to regeneration.

AU Snider W.D.; Zhou F.-Q.; Zhong J.; Markus A.

CS W.D. Snider, Neuroscience Center, University of North Carolina, Chapel Hill, NC 27599, United States. wsnider@med.unc.edu

SO Neuron, (3 Jul 2002) Vol. 35, No. 1, pp. 13-16. .
Refs: 24
ISSN: 0896-6273 CODEN: NERNET

CY United States

DT Journal; (Short Survey)

FS 008 Neurology and Neurosurgery
029 Clinical Biochemistry
LA English
SL English
ED Entered STN: 8 Aug 2002
Last Updated on STN: 8 Aug 2002

L17 ANSWER 17 OF 28 EMBASE COPYRIGHT (c) 2006 Elsevier B.V. All rights reserved on STN
TI Inosine regulates axon regeneration in retinal ganglion cells.
AB Objective: To investigate the involvement of purine in the development and regeneration of neurons. Methods: Goldfish were dark-adapted, and their retinas were dissected. Retinas were dissociated by gentle trituration. Repeated cycles of trituration and sedimentation yielded cultures nearly homogeneous in ganglion cells. Low-density cells in 24-well culture dishes were maintained in a serum free. Axonal outgrowth and survival of retinal ganglion cells (RGC) in response to purine were evaluated. Results: (1) Inosine stimulated axon outgrowth from RGC. Adenosine must be hydrolyzed to inosine via adenosine deaminase to stimulate RGC outgrowth. In the presence of adenosine deaminase inhibitor (deoxycoformycin), adenosine not only failed to stimulate growth, but also cause (RGC) to die. (2) 6-Thioguanine 10 μmol/L completely arrested axon outgrowth stimulated by AF-1 though not affecting cell survival. Inosine 100 μmol/L reversed the inhibitory effects of 6-thioguanine on AF-1 cometitively and may stimulate growth by direct activation of protein kinase-N. (3) Inosine increased expression of GAP-43 in RGC. (4) In signaling transduction studying, PD 98059 and LY 294002, specific inhibitors to MAPKK and PI3K respectively, either alone blocked 50% of growth by inosine, blocked 100% growth by inosine if combined together. Inosine may therefore stimulate growth via MEK-1/2 and PI3K pathways. Conclusion: Inosine plays an important role in the development and regeneration of RGC. It suggests the possibility of a clinically therapeutic opportunity to be explored further in central nervous system neuron diseases.
AN 2000235273 EMBASE
TI Inosine regulates axon regeneration in retinal ganglion cells.
AU Jing Y.; Irwin N.; Benowitz L.I.
CS Y. Jing, Beijing Tong Ren Hospital, Beijing 100730, China
SO Chinese Ophthalmic Research, (2000) Vol. 18, No. 3, pp. 221-223. .
Refs: 10
ISSN: 1003-0808 CODEN: YAYAFH
CY China
DT Journal; Article
FS 012 Ophthalmology
LA Chinese
SL English; Chinese
ED Entered STN: 20 Jul 2000
Last Updated on STN: 20 Jul 2000

L17 ANSWER 24 OF 28 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI A purine-sensitive mechanism regulates the molecular program for axon growth
AB Axon growth is characterized by a distinctive program of gene expression. We present evidence here that this program is regulated through a purine-sensitive mechanism, and that it can be re-activated in mature CNS neurons to induce extensive axon growth in vitro and in vivo. In dissociated goldfish retinal ganglion cells, the purine nucleoside inosine acts intracellularly to stimulate axon outgrowth by inducing the expression of GAP-43, Talpha-1 tubulin, and other growth-associated

proteins. The purine analog 6-thioguanine (6-TG) acts in the opposite fashion, blocking axon growth and the underlying program of molecular changes. Prior studies in PC12 cells have shown that 6-TG selectively inhibits the activity of N-kinase, a 47-49 kDa serine-threonine kinase. Inosine acts as a competitor of 6-TG, suggesting that it acts as an N-kinase agonist, and that this kinase is part of a modular signal transduction pathway controlling axon growth. Following unilateral transections of the corticospinal tract in mature rats, inosine applied to the intact sensorimotor cortex stimulated layer 5 pyramidal cells to upregulate GAP-43 expression and to sprout axon collaterals that crossed the midline and reinnervated regions of the cervical spinal cord which had lost their normal afferents. It will now be important to identify the molecular changes that lie upstream and downstream of N-kinase, and to explore the clinical potential of activating this pathway in patients who have sustained CNS injury.

AN 2002:694110 SCISEARCH
GA The Genuine Article (R) Number: 582YH
TI A purine-sensitive mechanism regulates the molecular program for axon growth
AU Benowitz L I (Reprint); Goldberg D E; Irwin N
CS Childrens Hosp, Labs Neurosci Res Neurosurg, 300 Longwood Ave, Boston, MA 02115 USA (Reprint); Childrens Hosp, Labs Neurosci Res Neurosurg, Boston, MA 02115 USA; Harvard Univ, Program Neurosci, Sch Med, Boston, MA 02115 USA; Harvard Univ, Dept Surg, Sch Med, Boston, MA 02115 USA
CYA USA
SO RESTORATIVE NEUROLOGY AND NEUROSCIENCE, (2001) Vol. 19, No. 1-2, pp. 41-49.
ISSN: 0922-6028.
PB IOS PRESS, NIEUWE HEMWEG 6B, 1013 BG AMSTERDAM, NETHERLANDS.
DT Article; Journal
LA English
REC Reference Count: 48
ED Entered STN: 6 Sep 2002
Last Updated on STN: 6 Sep 2002
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L17 ANSWER 26 OF 28 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI ENHANCEMENT OF NERVE-FIBER REGENERATION BY NUCLEOTIDES AFTER PERIPHERAL-NERVE CRUSH DAMAGE - ELECTROPHYSIOLOGIC AND MORPHOMETRIC INVESTIGATIONS
AB The effect of nucleotide administration on the regeneration of myelinated nerve fibres following crush injury to the sciatic nerve of the rat was studied using both morphometric and electroneurophysiologic techniques.

After a standardized localized crush lesion of the right sciatic nerve, rats were given nucleotides daily at a dosage of 3.0 mg/kg body wt uridine monophosphate (UMP), 2.5 mg/kg body wt cytidine monophosphate (CMP) or 3. 0 plus 2.5 mg/kg body wt UMP plus CMP, respectively. Observations were made after 20, 40 and 60 days of nerve regeneration for comparison with age-matched crushed or nonoperated controls. Electroneurophysiologic studies of right sural nerves were performed as single fibre measurements. Morphometry was performed on semithin transverse sections of the right common peroneal nerve with a fully automatic interactive image analysis system. Forty days after crush injury the single fibre conduction velocity of all type II afferents in the UMP/CMP treated group was significantly accelerated. There was a trend (10% greater-than-or-equal-to p greater-than-or-equal-to 5%) to increase of mean efferent single nerve fibre function at this time. Morphometry of nerve fibres revealed a trend to enlargement of mean fibre area and mean fibre diameter related to increased myelin area and myelin thickness.

After 60 days, there was a trend to increase of single fibre conduction velocity of all type II afferents in the UMP/CMP treated group.

Automated morphometry revealed a significant increase for the following parameters: fibre area, fibre diameter, myelin area, myelin thickness and axon area. In the UMP/CMP group, fibre density showed near normal values, as compared with nonoperated age-matched controls, and significantly lower values than in crushed controls. There were no significant effects after single drug administration.

The present results suggest that both axons (neurons) and myelin sheaths (Schwann cells) of regenerating nerve fibres are influenced by nucleotide administration and that combined UMP/CMP administration leads to accelerated regeneration.

AN 1992:602257 SCISEARCH
GA The Genuine Article (R) Number: JR293
TI ENHANCEMENT OF NERVE-FIBER REGENERATION BY NUCLEOTIDES AFTER PERIPHERAL-NERVE CRUSH DAMAGE - ELECTROPHYSIOLOGIC AND MORPHOMETRIC INVESTIGATIONS
AU WATTIG B (Reprint); SCHALOW G; HEYDENREICH F; WARZOK R; CERVOSNAVARRO J
CS UNIV GREIFSWALD, INST PATHOL, O-2200 GREIFSWALD, GERMANY (Reprint); FREE UNIV BERLIN, W-1000 BERLIN 33, GERMANY
CYA GERMANY
SO ARZNEIMITTEL-FORSCHUNG/DRUG RESEARCH, (SEP 1992) Vol. 42-2, No. 9, pp. 1075-1078.
ISSN: 0004-4172.
PB ECV-EDITIO CANTOR VERLAG MEDIZIN NATURWISSENSCHAFTEN, BANDELSTOCKWEG 20, POSTFACH 1255, D-88322 AULENDORF, GERMANY.
DT Article; Journal
FS LIFE
LA English
REC Reference Count: 35
ED Entered STN: 1994
Last Updated on STN: 1994
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

L17 ANSWER 27 OF 28 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN
TI ACCELERATION OF NERVE AND MUSCLE REGENERATION BY ADMINISTRATION OF NUCLEOTIDES - ELECTRONEUROPHYSIOLOGICAL AND MORPHOMETRICAL INVESTIGATIONS
AB The effect of nucleotide administration on the regeneration of myelinated nerve fibres following crush injury to the sciatic nerve of the rat was studied using morphometric techniques. In addition morphometrical investigations of peroneal and soleal muscles were performed at different times.

After a localized crush lesion of the right sciatic nerve, rats were given nucleotides daily at a dosage of 3.0 mg/kg body wt uridine monophosphate (UM), 2.5 mg/kg body wt cytidine monophosphate (CMP) or 3.0 plus 2.5 mg/kg body wt UMP plus CMP, respectively. Observations were made after 20, 40 and 60 days of common peroneal nerve regeneration for comparison with age-matched crushed or nonoperated controls.

Forty days after daily UMP/CMP administration the single fibre conduction velocity of all type II afferents was significantly accelerated. There was a trend towards increased mean fibre area related to increased myelin area. Mean diameter of type II muscle fibres was increased. After 60 days, there was a trend to increase of single afferent fibre conduction velocity in the UMP/CMP group. In the same group automated morphometry revealed a significant increase of nerve fibre area, myelin area and axon area. At this time an increase was found of type I and/or type II muscle fibres in all animal groups.

The present results suggest that both axons (neurons) and myelin sheaths (Schwann cells) of regenerating nerve fibres and regenerating muscle fibres are influenced by nucleotide administration.
AN 1992:270246 SCISEARCH
GA The Genuine Article (R) Number: HN947
TI ACCELERATION OF NERVE AND MUSCLE REGENERATION BY ADMINISTRATION OF NUCLEOTIDES - ELECTRONEUROPHYSIOLOGICAL AND MORPHOMETRICAL INVESTIGATIONS

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=> d his

     (FILE 'HOME' ENTERED AT 11:58:19 ON 20 SEP 2006)

     FILE 'CAPLUS' ENTERED AT 11:59:56 ON 20 SEP 2006
                E BORGENS/AU
L1           20 S E5-E8

     FILE 'MEDLINE, EMBASE, BIOSIS' ENTERED AT 12:01:53 ON 20 SEP 2006
L2          191 S L1
L3           90 DUP REMOVE L2 (101 DUPLICATES REMOVED)

     FILE 'MEDLINE' ENTERED AT 12:03:16 ON 20 SEP 2006
L4           62 S L1
L5            0 S L4 AND (NUCLEOTIDE OR INOSINE OR GUANOSINE OR PURINE)

     FILE 'CAPLUS' ENTERED AT 12:12:14 ON 20 SEP 2006
L6            1 S L2 AND (NUCLEOTIDE OR INOSINE OR GUANOSINE OR PURINE)
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L1 20 ("BORGENS R"/AU OR "BORGENS R B"/AU OR "BORGENS RICHARD"/AU OR "BORGENS RICHARD B"/AU)

=> d ibib abs 1-20

L1 ANSWER 1 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2006:637961 CAPLUS
DOCUMENT NUMBER: 145:180796
TITLE: Polyethylene glycol treatment after traumatic brain injury reduces β-amyloid precursor protein accumulation in degenerating axons
AUTHOR(S): Koob, Andrew O.; Borgens, Richard B.
CORPORATE SOURCE: Center for Paralysis Research, Department of Basic Medical Sciences, Purdue University, West Lafayette, IN, USA
SOURCE: Journal of Neuroscience Research (2006), 83(8), 1558-1563
CODEN: JNREDK; ISSN: 0360-4012
PUBLISHER: Wiley-Liss, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Polyethylene glycol (PEG; 2,000 MW; 30% volume/volume) is a non-toxic mol. that can be injected i.v. and possesses well-documented neuroprotective properties in the spinal cord of the guinea pig. Recent studies have shown that i.v. PEG can also enter the rat brain parenchyma after injury and repair cellular membrane damage in the region of the corpus callosum. Disrupted anterograde axonal transport and resulting β-amyloid precursor protein (APP) accumulation are byproducts of traumatic axonal injury (TAI) in the brain. APP accumulation indicates axonal degeneration as a result of axotomy, a detriment that can lead to cell death. In this study, we show that PEG treatment can eliminate APP accumulation in specific brain areas of rats receiving TAI. Six areas of the brain were analyzed: the medial cortex, hippocampus, lateral cortex, thalamus, medial lemniscus, and medial longitudinal fasciculus. Increased APP expression after injury was abolished in the thalamus and reduced in the medial longitudinal fasciculus by PEG treatment. In all remaining areas except for the lateral cortex, APP expression was not increased between injured and uninjured brains, indicating that damage was undetected in those brain areas in this study.
REFERENCE COUNT: 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 2 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:1347810 CAPLUS
DOCUMENT NUMBER: 144:205607
TITLE: Dose responses of three 4-aminopyridine derivatives on axonal conduction in spinal cord trauma
AUTHOR(S): McBride, Jennifer M.; Smith, Daniel T.; Byrn, Stephen R.; Borgens, Richard B.; Shi, Riyi
CORPORATE SOURCE: Department of Basic Medical Sciences, Center for Paralysis Research, Purdue University, West Lafayette, IN, 47907, USA
SOURCE: European Journal of Pharmaceutical Sciences (2006), 27(2-3), 237-242
CODEN: EPSCED; ISSN: 0928-0987
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB To explore novel treatments for enhancing conduction through traumatically injured spinal cord we have synthesized structurally distinct pyridine based compds.; N-(4-pyridyl) Me carbamate, N-(4-pyridyl) Et carbamate, and N-(4-pyridyl) t-Bu carbamate. With the use of a double sucrose gap-recording chamber we perform a dose-response assay to examine the

effects of these compds. on axonal conduction following an in vitro stretch injury. The tested compds. significantly enhanced axonal conduction to the stretch injured cord at 1 μM, a dose that coincides with the clin. relevant dose of potassium channel blocker 4-aminopyridine (4-AP). Me carbamate enhanced conduction maximally at 100 μM. This is also the most effective concentration of 4-AP in vitro. The other compds. Et carbamate and t-Bu carbamate enhanced conduction maximally at lower concns. of 10 and 1 μM. At higher concns. each of these compds. continued to increased CAP amplitude, however not significantly. Addnl., two of the compds. Et and t-Bu carbamate appear to have neg. effects on CAP amplitude when administered at or beyond 100 μM. These compds. demonstrate the possibility that derivs. of 4-AP can retain the ability to increase axonal conduction in the injured spinal cord.

REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 3 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:1046626 CAPLUS
DOCUMENT NUMBER: 143:415589
TITLE: Development of novel 4-aminopyridine derivatives as potential treatments for neurological injury and disease
AUTHOR(S): Smith, Daniel T.; Shi, Riyi; Borgens, Richard B.; McBride, Jennifer M.; Jackson, Kevin; Byrn, Stephen R.
CORPORATE SOURCE: Department of Industrial and Physical Pharmacy, Purdue University, West Lafayette, IN, 47907, USA
SOURCE: European Journal of Medicinal Chemistry (2005), 40(9), 908-917
CODEN: EJMCA5; ISSN: 0223-5234
PUBLISHER: Elsevier Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 143:415589

AB The amine position of the K+ channel blocker 4-aminopyridine was functionalized to form amide, carbamate and urea derivs. in an attempt to identify novel compds. which restore conduction in injured spinal cord. Eight derivs. were tested in vitro, using a double sucrose gap chamber, for the ability to restore conduction in isolated, injured guinea pig spinal cord. The Me, Et and t-Bu carbamates of 4-aminopyridine induced an increase in the post injury compound action potential. The Me and Et carbamates were further tested in an in vivo model of spinal cord injury. These results represent the first time that 4-aminopyridine has been derivatized without losing its ability to restore function in injured spinal cord tissue.

REFERENCE COUNT: 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 4 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2004:589347 CAPLUS
DOCUMENT NUMBER: 141:117178
TITLE: Method of treatment of central nervous system injury with purine nucleosides and optional electrical stimulation
INVENTOR(S): Borgens, Richard B.
PATENT ASSIGNEE(S): Purdue Research Foundation, USA
SOURCE: PCT Int. Appl., 38 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004060146	A2	20040722	WO 2003-US41480	20031230
WO 2004060146	A3	20050317		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2512049	AA	20040722	CA 2003-2512049	20031230
AU 2003300012	A1	20040729	AU 2003-300012	20031230
US 2004214790	A1	20041028	US 2003-748572	20031230
EP 1583544	A2	20051012	EP 2003-800277	20031230
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
CN 1732011	A	20060208	CN 2003-80107820	20031230
JP 2006517807	T2	20060803	JP 2004-565782	20031230
PRIORITY APPLN. INFO.:			US 2002-437104P	P 20021230
			WO 2003-US41480	W 20031230

AB Injuries to the central nervous system, particularly spinal cord injuries, are treated by administering a purine nucleoside or analog to the patient and, optionally, elec. stimulating the site of injury. In addition to the method of treatment, a kit containing a means for the application of elec. stimulation and a purine nucleoside or analog thereof is claimed.

L1 ANSWER 5 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:513486 CAPLUS
DOCUMENT NUMBER: 141:47362
TITLE: Pyridines for treating injured mammalian nerve tissue
INVENTOR(S): Borgens, Richard B.; Shi, Riyi; Byrn, Stephen R.; Smith, Daniel T.
PATENT ASSIGNEE(S): Purdue Research Foundation, USA
SOURCE: PCT Int. Appl., 51 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004052291	A2	20040624	WO 2003-US38834	20031205
WO 2004052291	A3	20041014		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2508165	AA	20040624	CA 2003-2508165	20031205
AU 2003298034	A1	20040630	AU 2003-298034	20031205
US 2004171587	A1	20040902	US 2003-730495	20031205
EP 1567497	A2	20050831	EP 2003-796756	20031205
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,				

IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK

CN 1745064	A	20060308	CN 2003-80109400		20031205
JP 2006515585	T2	20060601	JP 2004-559375		20031205
PRIORITY APPLN. INFO.:			US 2002-431637P	P	20021206
			WO 2003-US38834	W	20031205

OTHER SOURCE(S): MARPAT 141:47362

AB The invention provides novel pyridines, pharmaceutical compns. comprising such pyridines, and the use of such compns. in treating injured mammalian nerve tissue, including but not limited to an injured spinal cord in one embodiment, the compds., compns., and methods of the instant invention treat a mammalian nerve tissue injury by restoring action potential or nerve impulse conduction through a nerve tissue lesion. Significantly, in vivo application of compds. of the instant invention established, on the basis of SSEP testing, that the compds. provide longer lasting effects at lower concns. than comparable treatment with the known agent 4-aminopyridine (4 AP).

L1 ANSWER 6 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:323375 CAPLUS
DOCUMENT NUMBER: 140:350462
TITLE: Subcutaneous tri-block copolymer produces recovery from spinal cord injury
AUTHOR(S): Borgens, Richard B.; Bohnert, Debbie; Duerstock, Brad; Spomar, Daniel; Lee, Raphael C.
CORPORATE SOURCE: Center for Paralysis Research, School of Veterinary Medicine, Purdue University, West Lafayette, IN, 47907, USA
SOURCE: Journal of Neuroscience Research (2004), 76(1), 141-154
CODEN: JNREDK; ISSN: 0360-4012
PUBLISHER: Wiley-Liss, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB We have studied the ability of nonionic detergents and hydrophilic polymers to seal permeabilized membranes of damaged cells, rescuing them from progressive dissoln., degeneration, and death. We report that a single s.c. injection of the tri-block copolymer, Poloxamer 188 (P188) 6 h after a severe compression of the adult guinea pig spinal cord is able to: (1) preserve the anat. integrity of the cord; (2) produce a rapid recovery of nerve impulse conduction through the lesion; and (3) produce a behavioral recovery of a spinal cord dependent long tract spinal cord reflex. These observations stood out against a control group in blinded evaluation. Conduction through the lesion was monitored by stimulating the tibial nerve of the hind limb, and measuring the arrival of evoked potentials at the contralateral sensory cortex of the brain (somatosensory evoked potentials; SSEP). Behavioral recovery was determined by a return of sensitivity of formerly areflexic receptive fields of the cutaneous trunchi muscle (CTM) reflex. This contraction of back skin in response to tactile stimulation is totally dependent on the integrity of an identified bilateral column of ascending long tract axons. A statistically significant recovery of both SSEP conduction through the lesion and the CTM reflex occurred in P188-treated animals compared to vehicle-treated controls. Quant. 3D computer reconstruction of the lesioned vertebral segment of spinal cord revealed a statistically significant sparing of spinal cord parenchyma and a significant reduction in cavitation of the spinal cord compared to control animals. We determined that the proportion of P188-treated animals that recovered evoked potentials were nearly identical to that produced by a s.c. injection of polyethylene glycol (PEG). In contrast, P188 was not as effective as PEG in producing a recovery of CTM functioning. We discuss the likely differences in the mechanisms of action of these two polymers, and the possibilities inherent in a combined treatment.

REFERENCE COUNT: 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 7 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:453878 CAPLUS
DOCUMENT NUMBER: 140:177750
TITLE: A chemical sensor using neurons and a 3-D micro-fluidic chip
AUTHOR(S): McNally, H.; Kufluoglu, H.; Akin, D.; Grimmer, J.; Walker, J.; Shi, R.; Borgens, R.; Bashir, R.
CORPORATE SOURCE: School of Electrical and Computer Engineering, Purdue University, W. Lafayette, IN, 47907, USA
SOURCE: Materials Research Society Symposium Proceedings (2003), Volume Date 2002, 741(Nano- and Microelectromechanical Systems (NEMS and MEMS) and Molecular Machines), 247-252
CODEN: MRSPDH; ISSN: 0272-9172
PUBLISHER: Materials Research Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB In recent years, there has been a merger of microelectronics and biol. sciences to develop integrated nano and micro-scale biosensors or biochips. The implementation of portable, rapid and economic methods for detecting different biol. species on a chip will benefit from the development of electronic means for the anal. of cells. Neurons are very attractive as chemical sensors due to their sensitivity to specific toxins and their unique elec. properties. The use of closed well micro-fluidic devices for the growth of neurons has not been explored extensively. In this work, we will describe surface preparation techniques to enhance the neuronal cell viability and growth on microfabricated surfaces. We have fabricated micro-fluidic bio-chips for the trapping of neurons and to examine their growth. Neural cells are maintained in a chamber on the chip with fresh nutrient media continuously flowing through the chamber. The temporal viability of the neural cells within the chip will be reported. The long-term goals of the project include elec. measuring the viability of the cells inside the micro-fluidic chambers.
REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 8 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2002:888576 CAPLUS
DOCUMENT NUMBER: 137:363093
TITLE: Method and compositions using biomembrane fusion agents for treating mammalian nerve tissue injuries
INVENTOR(S): Shi, Riyi; Borgens, Richard B.
PATENT ASSIGNEE(S): Purdue Research Foundation, USA
SOURCE: PCT Int. Appl., 67 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002092107	A1	20021121	WO 2002-US13375	20020424

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,

BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

CA 2445612	AA	20021121	CA 2002-2445612	20020424
US 2003118545	A1	20030626	US 2002-132542	20020424
NZ 529526	A	20031219	NZ 2002-529526	20020424
EP 1389121	A1	20040218	EP 2002-741682	20020424
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2004527573	T2	20040909	JP 2002-589024	20020424
US 2005069520	A1	20050331	US 2004-901481	20040728
AU 2006200866	A1	20060323	AU 2006-200866	20060301

PRIORITY APPLN. INFO.:	US 2001-286200P	P 20010424
	EP 2002-741682	A 20020424
	US 2002-132542	A3 20020424
	WO 2002-US13375	W 20020424

AB To achieve, an in vivo repair of injured mammalian nerve tissue, an effective amount of a biomembrane fusion agent is administered to the injured nerve tissue. The application of the biomembrane fusion agent may be performed by directly contacting the agent with the nerve tissue at the site of the injury. Alternatively, the biomembrane fusion agent is delivered to the site of the injury through the blood supply after administration of the biomembrane fusion agent to the patient. The administration is preferably by parenteral administration including intravascular, i.m., s.c., or i.p. injection of an effective quantity of the biomembrane fusion agent so that an effective amount is delivered to the site of the nerve tissue injury. Biomembrane fusion agents include e.g. hydrophilic polymers (e.g. polyethylene glycol) and surfactants.

REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 9 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	2002:818684 CAPLUS
DOCUMENT NUMBER:	138:331586
TITLE:	Polyethylene glycol immediately repairs neuronal membranes and inhibits free radical production after acute spinal cord injury
AUTHOR(S):	Luo, Jian; Borgens, Richard; Shi, Riyi
CORPORATE SOURCE:	Department of Basic Medical Sciences, Institute for Applied Neurology, Center for Paralysis Research, Purdue University, West Lafayette, IN, 47907, USA
SOURCE:	Journal of Neurochemistry (2002), 83(2), 471-480 CODEN: JONRA9; ISSN: 0022-3042
PUBLISHER:	Blackwell Science Ltd.
DOCUMENT TYPE:	Journal
LANGUAGE:	English

AB Membrane disruption and the production of reactive oxygen species (ROS) are important factors causing immediate functional loss, progressive degeneration, and death in neurons and their processes after traumatic spinal cord injury. Using an in vitro guinea pig spinal cord injury model, we have shown that polyethylene glycol (PEG), a hydrophilic polymer, can significantly accelerate and enhance the membrane resealing process to restore membrane integrity following controlled compression. As a result of PEG treatment, injury-induced ROS elevation and lipid peroxidn. (LPO) levels were significantly suppressed. We further show that PEG is not an effective free radical scavenger nor does it have the ability to suppress xanthine oxidase, a key enzyme in generating superoxide. These observations suggest that it is the PEG-mediated membrane repair that leads to ROS and LPO inhibition. Furthermore, our data also imply an important causal effect of membrane disruption in generating ROS in spinal cord injury, suggesting membrane repair to be an effective target in reducing ROS genesis.

REFERENCE COUNT: 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 10 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2001:884548 CAPLUS
DOCUMENT NUMBER: 136:145146
TITLE: Rapid recovery from spinal cord injury after subcutaneously administered polyethylene glycol
AUTHOR(S): Borgens, Richard B.; Bohnert, Debra
CORPORATE SOURCE: Institute for Applied Neurology, Center for Paralysis Research, Department of Basic Medical Sciences, Purdue University, West Lafayette, IN, 47907-1244, USA
SOURCE: Journal of Neuroscience Research (2001), 66(6), 1179-1186
CODEN: JNREDK; ISSN: 0360-4012
PUBLISHER: Wiley-Liss, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Arguably a seminal event in most trauma and disease is the breakdown of the cell membrane. In most cells, this is first observed as a collapse of the axolemmal barrier properties allowing a derangement of ions to occur, leading to a progressive dissoln. of the cell or its process. We have shown that an artificial sealing of mech. damaged membranes by topical application of hydrophilic polymers such as polyethylene glycol (PEG) immediately restores variable levels of nerve impulse conduction through the lesion. This was documented by a rapid recovery of somatosensory evoked potential (SSEP) conduction, and by recovery of the cutaneous trunchi muscle (CTM) reflex in PEG-treated animals. The CTM reflex is a sensorimotor behavior dependent on an intact (and identified) white matter tract within the ventrolateral funiculus of the spinal cord, and is thus an excellent index of white matter integrity. We show that PEG can be safely introduced into the bloodstream by several routes of administration. Using a fluorescein decorated PEG, we demonstrate that the polymer specifically targets the hemorrhagic contusion of the adult guinea pig spinal cord when administered through the vasculature, but not intact regions of the spinal cord. A single s.c. injection (30% weight by weight in sterile saline) made 6 h after a standardized spinal cord contusion in adult guinea pigs was sufficient to produce a rapid recovery of SSEP propagation through the lesion in only PEG-treated animals, accompanied by a statistically significant recovery of the CTM reflex. These data suggest that parenterally administered PEG may be a novel treatment for not only spinal injury, but head injury and stroke as well.
REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 11 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:528416 CAPLUS
DOCUMENT NUMBER: 134:114586
TITLE: The macrophage in acute neural injury: Changes in cell numbers over time and levels of cytokine production in mammalian central and peripheral nervous systems
AUTHOR(S): Leskovar, Alenka; Moriarty, Loren J.; Turek, John J.; Schoenlein, Ingrid A.; Borgens, Richard B.
CORPORATE SOURCE: Center for Paralysis Research School of Veterinary Medicine, Purdue University, West Lafayette, IN, 47907, USA
SOURCE: Journal of Experimental Biology (2000), 203(12), 1783-1795
CODEN: JEBIAM; ISSN: 0022-0949
PUBLISHER: Company of Biologists Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We evaluated the timing and d. of ED-1-pos. macrophage accumulation (ED 1 is the primary antibody for the macrophage) and measured cytokine production by macrophages in standardized compression injuries to the spinal cord and sciatic nerves of individual rats 3, 5, 10 and 21 days post-injury. The

actual site of mech. damage to the nervous tissue, and a more distant site where Wallerian degeneration had occurred, were evaluated in both the peripheral nervous system (PNS) and the central nervous system (CNS) at these time points. The initial accumulation of activated macrophages was similar at both the central and peripheral sites of damage. Subsequently, macrophage densities at all locations studied were statistically significantly higher in the spinal cord than in the sciatic nerve at every time point but one. The peak concns. of three cytokines, tumor necrosis factor α (TNFα), interleukin-1 (IL-1) and interleukin-6 (IL-6), appeared earlier and were statistically significantly higher in injured spinal cord than in injured sciatic nerve. We discuss the meaning of these data relative to the known differences in the reparative responses of the PNS and CNS to injury.

REFERENCE COUNT: 76 THERE ARE 76 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 12 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:51638 CAPLUS
DOCUMENT NUMBER: 132:203028
TITLE: Immediate recovery from spinal cord injury through molecular repair of nerve membranes with polyethylene glycol
AUTHOR(S): Borgens, Richard B.; Shi, Riyi
CORPORATE SOURCE: Center for Paralysis Research, Department of Basic Medical Sciences, School of Veterinary Medicine, Purdue University, West Lafayette, IN, 47907, USA
SOURCE: FASEB Journal (2000), 14(1), 27-35
CODEN: FAJOEC; ISSN: 0892-6638
PUBLISHER: Federation of American Societies for Experimental Biology
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A brief application of the hydrophilic polymer polyethylene glycol (PEG) swiftly repairs nerve membrane damage associated with severe spinal cord injury in adult guinea pigs. A 2 min application of PEG to a standardized compression injury to the cord immediately reversed the loss of nerve impulse conduction through the injury in all treated animals while nerve impulse conduction remained absent in all sham-treated guinea pigs. Physiol. recovery was associated with a significant recovery of a quantifiable spinal cord dependent behavior in only PEG-treated animals. The application of PEG could be delayed for .apprx.8 h without adversely affecting physiol. and behavioral recovery which continued to improve for up to 1 mo after PEG treatment.

REFERENCE COUNT: 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 13 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1999:376637 CAPLUS
DOCUMENT NUMBER: 131:179700
TITLE: Acute repair of crushed guinea pig spinal cord by polyethylene glycol
AUTHOR(S): Shi, Riyi; Borgens, Richard B.
CORPORATE SOURCE: Center for Paralysis Research, Department of Basic Medical Sciences, Purdue University, West Lafayette, IN, 47907, USA
SOURCE: Journal of Neurophysiology (1999), 81(5), 2406-2414
CODEN: JONEA4; ISSN: 0022-3077
PUBLISHER: American Physiological Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We have studied the responses of adult guinea pig spinal cord white matter to a standardized compression within a sucrose gap recording chamber. This injury eliminated compound action potential (CAP) conduction through

the lesion, followed by little or no recovery of conduction by 1 h postinjury. We tested the ability of polyethylene glycol (PEG) to repair the injured axons and restore physiol. function. Local application of PEG (1,800 MW, 50% by weight in water) for .apprx.2 min restored CAP conduction through the injury as early as 1 min post PEG application. The recovery of the CAP ≤1 h was significantly greater in treated compared with control spinal cords (controls = 3.6% of the preinjury amplitude; PEG treated = 19%; P < 0.0001, unpaired Student's t-test). Stimulus-response anal. indicated that the susceptibility for recovery was similar for all calibers of axons after PEG application. The enhanced recovery of conduction after PEG treatment was associated with an early alteration in conduction properties relative to control spinal cords. This included increased refractoriness and sensitivity to potassium channel blockade using 4-aminopyridine (4-AP). Normally 4-AP enhanced the amplitude of the recovering CAPs by .apprx.40% in control spinal cords, however this effect was nearly doubled to .apprx.72% in PEG treated spinal cords. Because severe clin. injuries to the spinal cord (and some peripheral nerves) are both resistant to medical treatment and usually produced by compression, we discuss the possible clin. benefits of PEG application.

REFERENCE COUNT: 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 14 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1999:256212 CAPLUS

TITLE: Electrically mediated regeneration and guidance of adult mammalian spinal axons into polymeric channels

AUTHOR(S): Borgens, R. B.

CORPORATE SOURCE: Center for Paralysis Research, Department of Basic Medical Sciences, School of Veterinary Medicine, Purdue University, West Lafayette, IN, 47907, USA

SOURCE: Neuroscience (Oxford) (1999), 91(1), 251-264
CODEN: NRSCDN; ISSN: 0306-4522

PUBLISHER: Elsevier Science Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB An extracellular elec. field has been shown to influence the regeneration of nerve fibers within the adult mammalian spinal cord. However, in these studies, few axons were labeled by local application of intracellular markers relative to the number of axons transected. This has limited an evaluation of the robustness of the response, and the direction of growth of regenerating axons that might be influenced by the orientation of the applied voltage gradient. In this study, a hollow silicone rubber tube (c. 6 mm + 1 mm outside diameter) containing a cathodal (neg.) electrode was inserted longitudinally into the dorsal half of the adult guinea-pig spinal cord. The elec. field (.apprx. 100 μV/mm) was imposed within the damaged spinal cord with an implanted d.c. stimulator for about three weeks. Based on previous studies, this orientation of the elec. field would be expected to both initiate axonal regeneration and guide growing axons to, and into, the silicone guidance channel. In exptl. animals (n = 20), a robust regeneration of axons into the tube was observed in more than half the cases. These axons were traced from surrounding white and gray matter by anterograde and retrograde labeling using a tetramethylrhodamine-conjugated dextran as an intracellular marker. Control animals (n = 16) received tubes with inactive electrodes. It was rare to find any axons within control guidance channels, since adult mammalian central nervous system axons do not regenerate. This report provides evidence for not only the facilitated regeneration of adult mammalian central axons, but also their guidance, by an imposed elec. field.

REFERENCE COUNT: 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L1 ANSWER 15 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1996:584693 CAPLUS

TITLE: Reduction of the current of injury leaving the amputation inhibits limb regeneration in the red spotted newt
AUTHOR(S): Jenkins, Lisa S.; Duerstock, Bradley S.; Borgens, Richard B.
CORPORATE SOURCE: School Veterinary Medicine, Purdue Univ., West Lafayette, 47907-1244, India
SOURCE: Developmental Biology (1996), 178(2), 251-262
CODEN: DEBIAO; ISSN: 0012-1606
PUBLISHER: Academic
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Immediately following amputation of the limb in salamanders, a strong, steady, and polarized flow of ionic current is produced by the injury. Current flows in a proximodistal direction within the limb stump and is associated with a fall in elec. potential of about 50 mV/mm near the stump's end. This current is electrogenically driven by the Na+-dependent, internally pos. transcutaneous voltage of the intact skin of the limb stump. Reduction of this EMF, the skin's battery, by topical application of Na+ blocking agents leads to inhibition or disruption of normal limb regeneration. This suggests elec. factors are a critical control of limb regeneration. Here we test another means to reduce the injury current and its associated elec. field within the forelimb stump of red spotted newts. A fine (40 gauge), insulated, multistrand wire was inserted beneath the skin of the animal's back, with the uninsulated portion terminating either at the shoulder region or at the base of the tail. When this cathodal (neg.) electrode is connected to a regulated current source, sufficient current was pulled into the stump end from an external anode (placed in the water the animal was immersed in) to markedly reduce or null the endogenous current for the first 8 days following amputation. The extent of limb regeneration in sham-treated and exptl. treated animals was determined 1 mo following amputation at the elbow. Sham-treated animals regenerated normally, with most producing digits within this time. Limb regeneration was completely arrested, or caused to be strikingly hypomorphic, in half of the exptl. treated animals. This effect was independent of where the s.c. electrode was placed and suggests that elec. (physiol.) factors are indeed a critical control of limb regeneration in urodeles.

L1 ANSWER 16 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1994:601244 CAPLUS
DOCUMENT NUMBER: 121:201244
TITLE: Embryonic neuroepithelial sodium transport, the resulting physiological potential, and cranial development
AUTHOR(S): Shi, Riyi; Borgens, Richard B.
CORPORATE SOURCE: School of Veterinary Medicine, Purdue University, West Lafayette, IN, 47907-1244, USA
SOURCE: Developmental Biology (Orlando, FL, United States) (1994), 165(1), 105-16
CODEN: DEBIAO; ISSN: 0012-1606
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The authors have shown that the amiloride/novobiocin-sensitive Na+ transport system of adult animal integuments is first observed in embryonic surface ectoderm and show here that this physiol. is retained in this ectoderm following the closure of the neural folds in axolotl (Ambystoma mexicanum) embryos. Unidirectional transport of Na+ out of the neural tube lumen results in a p.d. on the order of 40-90 mV, neg. with respect to the abluminal surface. This transneural tube potential can be collapsed by iontophoresis of Na+ channel blockers amiloride or benzamil into the lumen, leading to severe cranial defects and incomplete morphogenesis. Modestly increasing the transneural tube potential with injection of novobiocin into the lumen also produces a lesser degree of

developmental abnormality. The authors discuss the ways in which this physiol. may help control the organization of the early nervous system.

L1 ANSWER 17 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1984:488385 CAPLUS
DOCUMENT NUMBER: 101:88385
TITLE: Endogenous ionic currents traverse intact and damaged bone
AUTHOR(S): Borgens, Richard B.
CORPORATE SOURCE: Sch. Vet. Med., Purdue Univ., West Lafayette, IN, 47907, USA
SOURCE: Science (Washington, DC, United States) (1984), 225(4661), 478-82
CODEN: SCIEAS; ISSN: 0036-8075
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Living bone drives an elec. current through itself and into sites of damage. Such fracture currents consist of 2 components: an intense, decaying current dependent on bone deformation and a stable, persistent current driven by a cellular battery. The latter is carried by Cl- and, to a lesser extent, by Na+, Mg2+, and Ca2+. Endogenous fracture currents are of the same polarity and similar magnitude as clin. applied currents that are successful in treating chronic nonunions in fractures bones. The defect in biol. nonunions may reside in the electrophysiol. of repair.

L1 ANSWER 18 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1982:17451 CAPLUS
DOCUMENT NUMBER: 96:17451
TITLE: Injury, ionic current, and regeneration
AUTHOR(S): Borgens, Richard B.
CORPORATE SOURCE: Dep. Biol., Yale Univ., New Haven, CT, USA
SOURCE: Mech. Growth Control, [Pap. Meet.] (1981), Meeting Date 1979, 107-36. Editor(s): Becker, Robert O. Thomas: Springfield, Ill.
CODEN: 46VMAX
DOCUMENT TYPE: Conference; General Review
LANGUAGE: English
AB A review with 52 refs. of the role of wound potentials and ionic currents in limb regeneration in salamanders.

L1 ANSWER 19 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1980:161485 CAPLUS
DOCUMENT NUMBER: 92:161485
TITLE: Large and persistent electrical currents enter the transected lamprey spinal cord
AUTHOR(S): Borgens, Richard B.; Jaffe, Lionel F.; Cohen, Melvin J.
CORPORATE SOURCE: Dep. Biol., Yale Univ., New Haven, CT, 06520, USA
SOURCE: Proceedings of the National Academy of Sciences of the United States of America (1980), 77(2), 1209-13
CODEN: PNASA6; ISSN: 0027-8424
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The elec. currents at the surface of the proximal portion of an isolated and transected lamprey spinal cord were measured with an extracellular vibrating probe. Soon after transection, currents of .apprx.0.5 mA/cm2 entered the cut surface of the spinal cord. These currents fell to .apprx.25% of their initial value within an h. Within the next 2 days they gradually declined from .apprx.100 μA/cm2 to .apprx.4 μA/cm2. They then remained constant up to 6 days posttransection, when the measurements were ended. The pattern of current entry included substantial peaks opposite (and presumably into) the cut ends of giant axons. Response to changes in the ionic composition of the medium indicated

that about half of the injury current consists of Na+, and that much of the rest may consist of Ca2+. The measured influx of ions, which adds up to several coulombs per cm2 in a few days, should radically alter the ionic composition of the terminal few millimeters of neural tissues. Thus, it may be important in the degenerative and regenerative responses of neurons to axotomy.

L1 ANSWER 20 OF 20 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1979:571998 CAPLUS
DOCUMENT NUMBER: 91:171998
TITLE: Reduction of sodium dependent stump currents disturbs urodele limb regeneration
AUTHOR(S): Borgens, Richard B.; Vanable, Joseph W., Jr.; Jaffe, Lionel F.
CORPORATE SOURCE: Biol. Dep., Purdue Univ., West Lafayette, IN, 47907, USA
SOURCE: Journal of Experimental Zoology (1979), 209(3), 377-86
CODEN: JEZOAO; ISSN: 0022-104X
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The natural elec. currents which leave urodele limb stumps are needed for their regeneration. Such currents were reduced in the tiger salamander, Abmystoma tigrinum, by applying 0.5 mM amiloride to the stump skin or by immersion of these animals or Notophthalmus viridescens in Na+-depleted media. Limb regeneration in half of the amiloride-treated animals was either entirely blocked or glossly deficient, whereas the others regenerated normally. Limb regeneration in Na+-depleted media was consistently inhibited for some wk but then recovered.